Product Specifications

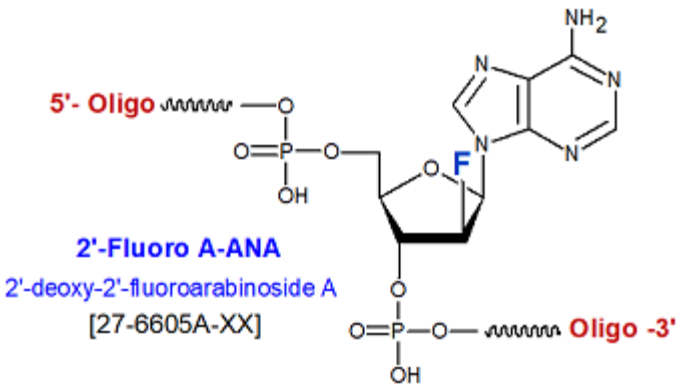
Custom Oligo Synthesis, antisense oligos, RNA oligos, chimeric oligos, Fluorescent dyes, Affinity Ligands, Spacers & Linkers, Duplex Stabilizers, Minor bases, labeled oligos, Molecular Beacons, siRNA, phosphonates Locked Nucleic Acids (LNA); 2′-5′ linked Oligos

Oligo Modifications

For research use only. Not for use in diagnostic procedures for clinical purposes.

2'-F-ANA-A

Category	Antisense & siRNA
Modification Code	FANA-A
Reference Catalog Number	27-6605A
5 Prime	Y
3 Prime	Y
Internal	Y
Molecular Weight(mw)	331.2



Antisense Oligos (ODN) & siRNA Oligo Modifications
Click here for more information on antisense modifications, design & applications.

Arabinonucleosides are epimers of ribonucleosides with the chiral switch being at the 2' position of the sugar residue. 2'-F-ANA adopts a more DNA-like B-type helix conformation, not through the typical C2-endo conformation but, rather, through an unusual O4'-endo (east) pucker. However, the presence of the electronegative fluorine leads to a still significant increase (DTm1.2^{O}C/mod) in melting temperature per modification (1). 2'-F-ANA-containing oligonucleotides exhibit very high binding specificity to their targets. Indeed, a single mismatch in a 2'-F-ANA-RNA duplex leads to a DTm of -7.2^{O}C and in a 2'-F-ANA - DNA duplex a DTm of -3.9^{O}C (2).
The presence of fluorine at the 2' position in 2' F-ANA leads to increased stability to hydrolysis under basic conditions relative to RNA and even 2'-F-RNA (1,3). The stability of 2'-F-ANA to nucleases also makes this a useful modification for enhancing the stability of oligonucleotides in biological environments (2). 2' F-ANA hybridizes strongly to target RNA and, unlike most 2' modifications, induces cleavage of the target by RNase H. Phosphorothioate (PS) 2' F-ANA is routinely used in these applications due to its increased nuclease resistance. Alternating 2' F-ANA and DNA units provide among the highest potency RNase H-activating oligomers. Both the "altimer" and "gapmer" strand architectures consistently outperform PS-DNA and DNA/RNA gapmers (4).
siRNA oligos were found to tolerate the presence of 2'-F-ANA linkages very well. High potency gene silencing was demonstrated5 with siRNA chimeras containing 2'-F-RNA and/or LNA and 2'-F-ANA. The high efficacy of these chimeras was attributed to the combination of the rigid RNA-like properties of 2'-F-RNA and LNA with the DNA-like properties of 2'-F-ANA.
Additional Recommended Reading Glen Report 22.13.
References E. Viazovkina, M.M. Mangos, M.I. Elzagheid, and M.J. Damha, Curr Protoc Nucleic Acid Chem, 2002, Chapter 4, Unit 4 15. J.K. Watts, and M.J. Damha, Can. J.

Chem., 2008, 86, 641-656. J.K. Watts, A. Katolik, J. Viladoms, and M.J. Damha, Org Biomol Chem, 2009, 7, 1904-10. A. Kalota, et al., Nucleic Acids Res., 2006, 34, 451. G.F. Deleavey, et al., Nucleic Acids Res., 2010, 38, 4547-4557, J.K. Watts, et al., Nucleic Acids Res., 2007, 35, 1441-1451, T. Dowler, et al., Nucleic Acids Res., 2006, 34, 1669-1675. Intellectual Property 2'-F-ANA is covered by intellectual property. Key patents covering siRNA and antisense applications are as follows: WO/2009/146556 (siRNA); WO 03064441 and WO 0220773 (antisense).